1.  (Currently Amended)  A coordinates correction apparatus comprising:

coordinate input means being placed on a display;

display control means for controlling display of a plurality of reference points on the display such that all of the reference points yet to be designated are displayed for designation in ~~a user-determined~~ an arbitrary order, the reference points indicating positions for user-designated coordinates on the coordinate input means;

coordinates reception means for receiving coordinates designated for the displayed reference points by user via said coordinate input means;

discriminating means for discriminating ~~which~~ a reference point ~~corresponds~~ corresponding to the user-designated coordinate received by said coordinate reception means as a discriminated reference point, from the displayed reference points;

coordinates keeping means for keeping the user-designated coordinate as the coordinate corresponding to the reference point discriminated by said discriminating means;

parameter calculation means for calculating coordinates correction parameters for nonlinear conversion, based on the coordinates kept by said coordinate keeping means;

parameter keeping means for keeping the calculated coordinates correction parameters for nonlinear conversion; and

coordinates correction means for correcting the coordinates inputted via said coordinates input means by the nonlinear conversion using the coordinates correction parameters kept by the parameter keeping means,

wherein said display control means controls reference points so as not to display the discriminated reference point discriminated by said discriminating means.

2.     (Previously Presented)  The coordinates correction apparatus of Claim 1, wherein the coordinates correction parameters are a, b, c, d, e, f, g, and h and wherein the nonlinear conversion for correcting the coordinates (x, y) inputted via the coordinates input  means to corrected coordinates (X, Y) is expressed by:

$$X = axy + bx + cy + d$$

$$Y = exy + fx + gy + h.$$

3.     (Cancelled)

4.     (Original)  The coordinates correction apparatus of Claim 1, further comprising a coordinates output means for outputting the coordinates corrected by the coordinates correction means.

5.     (Cancelled)

6.     (Cancelled)

7.     (Previously Presented)  The coordinates correction apparatus of Claim 1, wherein the processes being executed by said display control means, said coordinate reception means, said discriminating means and said coordinate keeping means

repeat until the user-designated coordinates are kept for all of the plurality of reference points, and wherein the parameter calculation means calculates the coordinates correction parameters for the nonlinear conversion based on the coordinates kept for all of the plurality of reference points.

8.     (Previously Presented)  The coordinates correction apparatus of Claim 1, wherein the parameter calculation means calculates the coordinates correction parameters by solving simultaneous equations based on the kept coordinates corresponding to the plurality of displayed reference points.

9.     (Previously Presented)  The coordinates correction apparatus of Claim 1, wherein said display is a liquid crystal display.

10.     (Previously Presented)  The coordinates correction apparatus of Claim 1, wherein the plurality of displayed reference points is four reference points expressed in pairs of two x coordinates and two y coordinates in an xy rectangular coordinates system.

11.     (Previously Presented)  The coordinates correction apparatus of Claim 10, wherein the parameter calculation means calculates the coordinates correction parameters a, b, c, d, e, f, g, and h by solving the following formulas where the coordinates of the four reference points as $(X_0, Y_0)$, $(X_1, Y_0)$, $(X_0, Y_1)$, and $(X_1, Y_1)$, setting the received coordinates as $(x_{nw}, y_{nw})$, $(x_{ne}, y_{ne})$, $(x_{sw}, y_{sw})$, and

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$(x_{se}, y_{se})$;

$$X_0 = ax_{nw}y_{nw} + bx_{nw} + cy_{nw} + d$$

$$Y_0 = ex_{nw}y_{nw} + fx_{nw} + gy_{nw} + h$$

$$X_1 = ax_{ne}y_{ne} + bx_{ne} + cy_{ne} + d$$

$$Y_0 = ex_{ne}y_{ne} + fx_{ne} + gy_{ne} + h$$

$$X_0 = ax_{sw}y_{sw} + bx_{sw} + cy_{sw} + d$$

$$Y_1 = ex_{sw}y_{sw} + fx_{sw} + gy_{sw} + h$$

$$X_1 = ax_{se}y_{se} + bx_{se} + cy_{se} + d$$

$$Y_1 = ex_{se}y_{se} + fx_{se} + gy_{se} + h,$$

wherein the parameter keeping means keeps the calculated coordinates correction parameters a, b, c, d, e, f, g, and h, and

wherein the coordinates correction means corrects the coordinates inputted via said coordinate input means (x, y) to corrected coordinates (X, Y) by the nonlinear conversion

$$X = axy + bx + cy + d$$

$$Y = exy + fx + gy + h.$$

12.    (Previously Presented)  The coordinates correction apparatus of Claim 1, further comprising a deciding means for deciding to control reference point display using said display control means, to receive coordinates using said coordinates reception means, to discriminate using said discriminating means, to keep user-designated coordinates using said coordinates keeping means and to calculate coordinates correction

parameters using said parameter calculation means in a case that said parameter keeping

means does not keep the coordinates correction parameters.


13.    (Previously Presented)  The coordinates correction apparatus of

Claim 1, wherein the coordinates correction apparatus is a portable information processing

apparatus.


14.    (Previously Presented)  The coordinates correction apparatus of

Claim 1, wherein the coordinates correction apparatus can be connected to a network.


15 to 21.    (Cancelled)


22.    (Currently Amended)  A coordinates correction method for

controlling a coordinates correction apparatus which has a coordinate input means placed

on a display, the method comprising:

controlling display of a plurality of reference points on the display such that

all of the reference points yet to be designated are displayed for designation in a user-

determined an arbitrary order, the reference points indicating positions for user-designated

coordinates on the coordinate input means;

receiving coordinates designated for the displayed reference points by user

via said coordinate input means;

discriminating which a reference point corresponds to the user-designated

coordinate corresponding received in said receiving coordinates as a discriminated

reference point, from the displayed reference points;

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keeping the user-designated coordinate as the coordinate corresponding to the reference point discriminated in said discriminating which reference point corresponds to the user-designated coordinate;

calculating coordinates correction parameters for nonlinear conversion, based on the coordinates kept in said step of keeping user-designated ~~corrdinate~~ coordinate;

keeping the calculated coordinates correction parameters for nonlinear conversion; and

correcting the coordinates inputted in the coordinates receiving ~~coordinate input~~ step by the nonlinear conversion using the kept in said ~~step of~~ keeping the calculated coordinates correction parameters,

wherein the discriminated reference point discriminated in said discriminating is not displayed in said controlling display.

23.    (Currently Amended)  The coordinates correction method of Claim 22, wherein the coordinates correction parameters are a, b, c, d, e, f, g, and h, and wherein the nonlinear conversion for correcting the coordinates (x, y) inputted via the coordinates receiving ~~input~~ step to the corrected coordinates (X, Y) in said coordinates correction step is represented by

$$X = axy + bx + cy + d$$

$$Y = exy + fx + gy + h.$$

24.    (Cancelled)

25.    (Original)  The coordinates correction method of Claim 22, further comprising a coordinates output step of outputting the coordinates corrected in the coordinates correction step.

26.    (Cancelled)

27.    (Cancelled)

28.    (Previously Presented)  The coordinates correction method of Claim 22, wherein said steps of controlling display of a plurality of reference points, receiving coordinates, discriminating which reference point corresponds to the user-designated coordinate and keeping the user-designated coordinate are repeated until the user-designated coordinates are kept for all of the plurality of reference points, and wherein the coordinates correction parameters for the nonlinear conversion based on the coordinates kept for all of the plurality of reference points are calculated in said step of calculating coordinates correction parameters.

29.    (Previously Presented)  The coordinates correction method of Claim 22, wherein said step of calculating coordinates correction parameter is executed by solving simultaneous equations based on the kept coordinates corresponding to the plurality of displayed reference points.

30. (Previously Presented) The coordinates correction method of Claim 22, wherein said display is liquid crystal display.

31. (Previously Presented) The coordinates correction method of Claim 22, wherein the plurality of displayed reference points is four reference points expressed in pairs of two x coordinates and two y coordinates in an xy rectangular coordinates system.

32. (Currently Amended) The coordinates correction method of Claim 31, wherein coordinates correction parameters, a, b, c, d, e, f, g, and h, are calculated in the parameter calculation step by solving the following formulas where the coordinates of the four reference points as $(X_0, Y_0)$, $(X_1, Y_0)$, $(X_0, Y_1)$, and $(X_1, Y_1)$, setting the received coordinates as $(x_{nw}, y_{nw})$, $(x_{ne}, y_{ne})$, $(x_{sw}, y_{sw})$, and $(x_{se}, y_{se})$:

$$X_0 = ax_{nw}y_{nw} + bx_{nw} + cy_{nw} + d$$

$$Y_0 = ex_{nw}y_{nw} + fx_{nw} + gy_{nw} + h$$

$$X_1 = ax_{ne}y_{ne} + bx_{ne} + cy_{ne} + d$$

$$Y_0 = ex_{ne}y_{ne} + fx_{ne} + gy_{ne} + h$$

$$X_0 = ax_{sw}y_{sw} + bx_{sw} + cy_{sw} + d$$

$$Y_1 = ex_{sw}y_{sw} + fx_{sw} + gy_{sw} + h$$

$$X_1 = ax_{se}y_{se} + bx_{se} + cy_{se} + d$$

$$Y_1 = ex_{se}y_{se} + fx_{se} + gy_{se} + h,$$

wherein the calculated coordinates correction parameters are kept in the parameter keeping step, and

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wherein the coordinates inputted via said <u>coordinates receiving</u> ~~coordinate~~

~~input~~ step (x, y) are corrected to corrected coordinates (X, Y) in the coordinates correction

steps by the nonlinear conversion

$$X = axy + bx + cy + d$$

$$Y = exy + fx + gy + h.$$

33.     (Previously Presented)  The coordinates correction method of Claim

22, further comprising deciding to perform said steps of controlling display of a plurality of

reference points, receiving coordinates, discriminating which reference point corresponds

to the user-designated coordinate, keeping the user-designated coordinate and calculating

coordinates correction parameters in a case that said step of keeping calculated coordinates

correction parameters does not keep the coordinates correction parameters.

34.     (Previously Presented)  The coordinates correction method of

Claims 22 which is a coordinates correction method for controlling a portable information

processing apparatus.

35 to 41.  (Cancelled)

42.     (Currently Amended)  A computer-readable memory medium for

storing a coordinates correction control program for controlling a coordinates correction

apparatus which has a coordinate input means placed on a display, <u>execution steps of</u> the

program comprising:

~~code to control~~ controlling display of a plurality of reference points on the display such that all of the reference points yet to be designated are displayed for designation in ~~a user-determined~~ an arbitrary order, the reference points indicating positions for user-designated coordinates on the coordinate input means;

~~code to receive~~ receiving coordinates designated for the displayed reference points by user via said coordinate input means;

~~code to discriminate~~ discriminating ~~which~~ a reference point ~~corresponds~~ corresponding to the user-designated coordinate received in said receiving coordinates as a discriminated reference point, from the displayed reference points;

~~code to keep~~ keeping the user-designated coordinate as the coordinate corresponding to the reference point discriminated in said discriminating which reference point corresponds to the user-designated coordinate;

~~code to calculate~~ calculating coordinates correction parameters for nonlinear conversion, based on the coordinates kept in said ~~code to keep~~ step of keeping user-designated coordinates;

~~code to keep~~ keeping the calculated coordinates correction parameters for nonlinear conversion; and

~~code to correct~~ correcting the coordinates inputted in the coordinates receiving ~~coordinate input~~ step by the nonlinear conversion using the ~~coordinates correction parameters~~ kept in said ~~code to keep~~ keeping the calculated coordinates correction parameters

wherein the discriminated reference point discriminated in said discriminating is not displayed in said controlling display.

43. (Currently Amended) The computer-readable memory medium of Claim 42, wherein the coordinates correction parameters are a, b, c, d, e, f, g, and h, and wherein the nonlinear conversion for correcting the coordinates (x, y) inputted via the coordinates receiving ~~input~~ step to the corrected coordinates (X, Y) in said coordinates correction step is represented by

$$X = axy + bx + cy + d$$

$$Y = exy + fx + gy + h.$$

44. (Cancelled)

45. (Currently Amended) The computer-readable memory medium of Claim 42, further comprising ~~a coordinates output step of~~ outputting coordinates corrected in said ~~the~~ coordinates correction step.

46. (Cancelled)

47. (Cancelled)

48. (Currently Amended) The computer-readable memory medium for storing a coordinates correction control program of Claim 42, wherein said controlling ~~code to control~~ display of a plurality of reference points, said receiving ~~code to receive~~ coordinates, said discriminating a ~~code to discriminate which~~ reference point corresponds to the user-designated coordinate and said keepting ~~code to keep~~ the user-designated

coordinate are repeated until the user-designated coordinates are kept for all of the plurality of reference points, and wherein the coordinates correction parameters for the nonlinear conversion based on the coordinates kept for all of the plurality of reference points are calculated in said calculating coordinates correction parameters.

49.     (Currently Amended)  The computer-readable memory medium of Claim 42, wherein said <u>calculating</u> ~~code to calculate~~ coordinates correction parameter is executed by solving simultaneous equations based on the kept coordinates corresponding to the plurality of displayed reference points.

50.     (Previously Presented)  The computer-readable memory medium of Claim 42, wherein said display is liquid crystal display.

51.     (Previously Presented)  The computer-readable memory medium of . Claim 42, wherein the plurality of displayed reference points is four reference points expressed in pairs of two x coordinates and two y coordinates in an xy rectangular coordinates system.

52.     (Currently Amended)  The computer-readable memory medium of Claim 51, wherein coordinates correction parameters, a, b, c, d, e, f, g, and h, are calculated in the parameter calculation step by solving the following formulas where the coordinates of the four reference points as $(X_0, Y_0)$, $(X_1, Y_0)$, $(X_0, Y_1)$, and $(X_1, Y_1)$, setting the received coordinates as $(x_{nw}, y_{nw})$, $(x_{ne}, y_{ne})$, $(x_{sw}, y_{sw})$, and $(x_{se}, y_{se})$:

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$$X_0 = ax_{nw}y_{nw} + bx_{nw} + cy_{nw} + d$$

$$Y_0 = ex_{nw}y_{nw} + fx_{nw} + gy_{nw} + h$$

$$X_1 = ax_{ne}y_{ne} + bx_{ne} + cy_{ne} + d$$

$$Y_0 = ex_{ne}y_{ne} + fx_{ne} + gy_{ne} + h$$

$$X_0 = ax_{sw}y_{sw} + bx_{sw} + cy_{sw} + d$$

$$Y_1 = ex_{sw}y_{sw} + fx_{sw} + gy_{sw} + h$$

$$X_1 = ax_{se}y_{se} + bx_{se} + cy_{se} + d$$

$$Y_1 = ex_{se}y_{se} + fx_{se} + gy_{se} + h,$$

wherein the calculated coordinates correction parameters are kept in the parameter keeping step, and

wherein the coordinates inputted via said <u>coordinates receiving</u> ~~coordinate input~~ step (x, y) are corrected to corrected coordinates (X, Y) in the coordinates correction steps by the nonlinear conversion

$$X = axy + bx + cy + d$$

$$Y = exy + fx + gy + h.$$

53.     (Currently Amended)  The computer-readable memory medium of Claim 42, further comprising ~~a step of~~ deciding to execute said display controlling step, said coordinates receiving step, and said parameter calculation step if said keeping step does not keep the coordinates correction parameters.

54.     (Currently Amended)  The computer-readable memory medium of Claim 42, <u>wherein the program</u> ~~which~~ is a coordinates correction program for controlling a

portable information processing apparatus.

55 to 61.   (Cancelled)

62.   (Previously Presented)  The coordinate correction apparatus according to Claim 1, wherein said display control means causes the displayed reference point to disappear as said coordinates reception means receives the coordinates corresponding to the reference point.

63.   (Previously Presented)  The coordinate correction method of Claim 22, wherein said controlling display of a plurality of reference points on the display further comprises causing the displayed reference points to disappear as the coordinates corresponding to the reference point are received by said receiving coordinates step.

64.   (Currently Amended)  The computer readable memory medium of Claim 42, wherein said controlling code to control display of a plurality of reference points on the display further comprises causing code to cause the displayed reference points to disappear as the coordinates corresponding to the reference point are received by said code to receive receiving coordinates step.